MONTHLY PROGRESS REPORT

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# CAVITATION STUDIES IN LIQUID HYDROGEN

by

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## SUMMARY

This report describes continuation of the facility design and equipment procurement, planning and progress for the project.

## INTRODUCTION

The present scope of work is concerned with the application, where feasible, of existing equipment and facility from a previous cavitation project. This requires modification of facility and equipment on hand; design, procurement, and fabrication of necessary additional equipment. Also there are some components which require further investigation before the final decisions can be made.

## BODY OF REPORT

Revisions of existing drawings to accommodate the venturi test section and related instrumentation stations together with necessary changes required for LOX compatability of the system are nearly complete. The purchasing of materials and required machine shop work is continuing.

A mock-up test section utilizing a high compression elastomeric "O" ring seal design between the lucite and metal flange was fabricated and tested with negative results. Leakage occurred under 100 psig helium gas pressure with the temperature at 76°K. It is believed, with higher pressures on the "O" ring, the seal design can be made to perform satisfactorily, therefore, a new test section will be fabricated and tested.

Difficulty was experienced by personnel of another project in obtaining proper illumination for the Fastax 8 mm. camera. However, good results were obtained by the same personnel using a 8 mm. Photosonic camera which has the capability of taking 1,000 frames per second at a 25 micro-second exposure time per frame. Further investigation of a proper camera and light source will continue.

It is planned to use a turbine type flow meter backed up by a volume-height liquid level measurement of the supply dewar for flow measurements.

Instrumentation requirements for temperature and pressure measurements are being investigated.

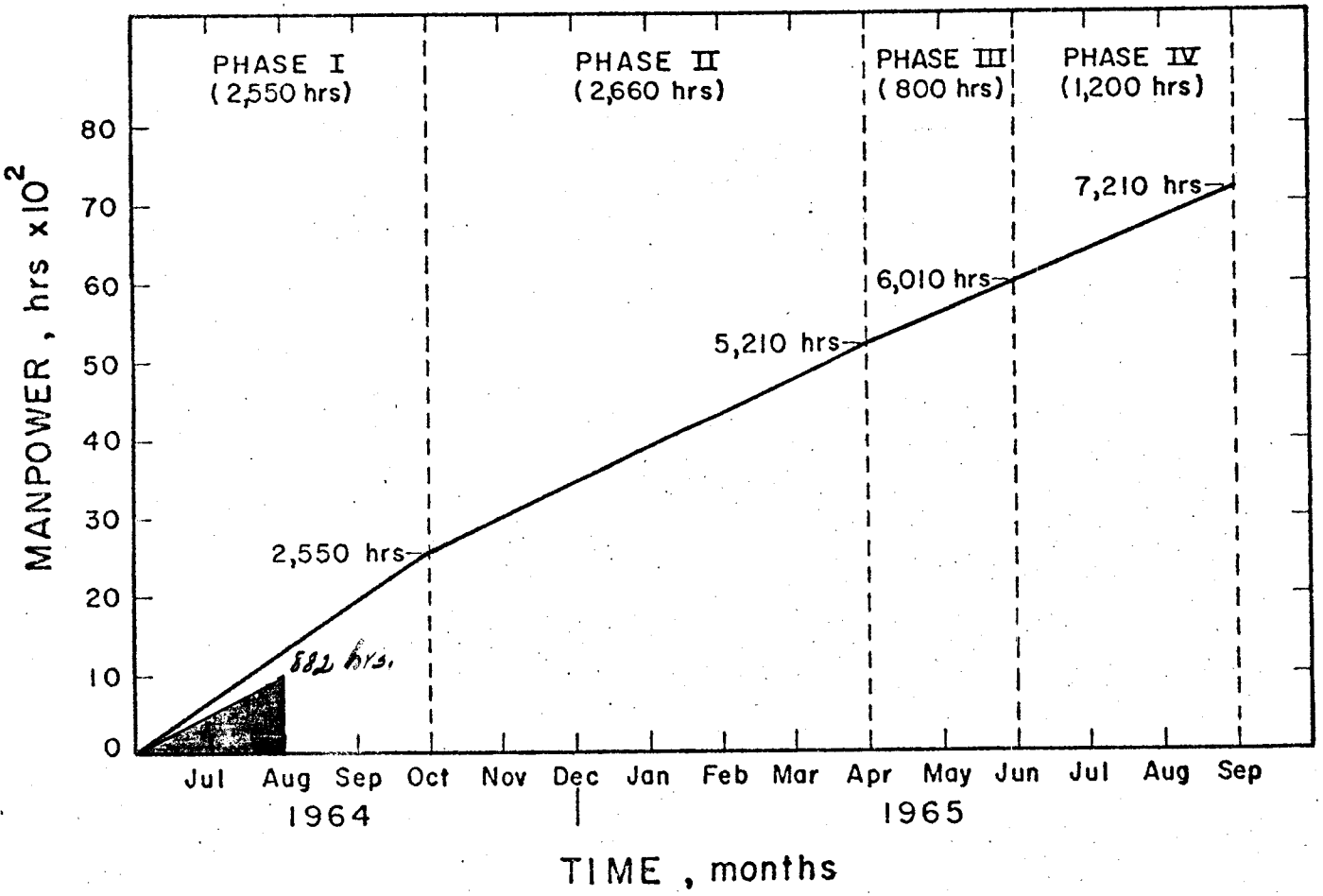
Enclosed are drawings of the overall test apparatus and view ports and vacuum shell surrounding the test section.

For the forthcoming reporting period work will continue on design, procurement and fabrication.

# ESTIMATION OF MANPOWER vs. TIME

Contractor : NBS-CELD

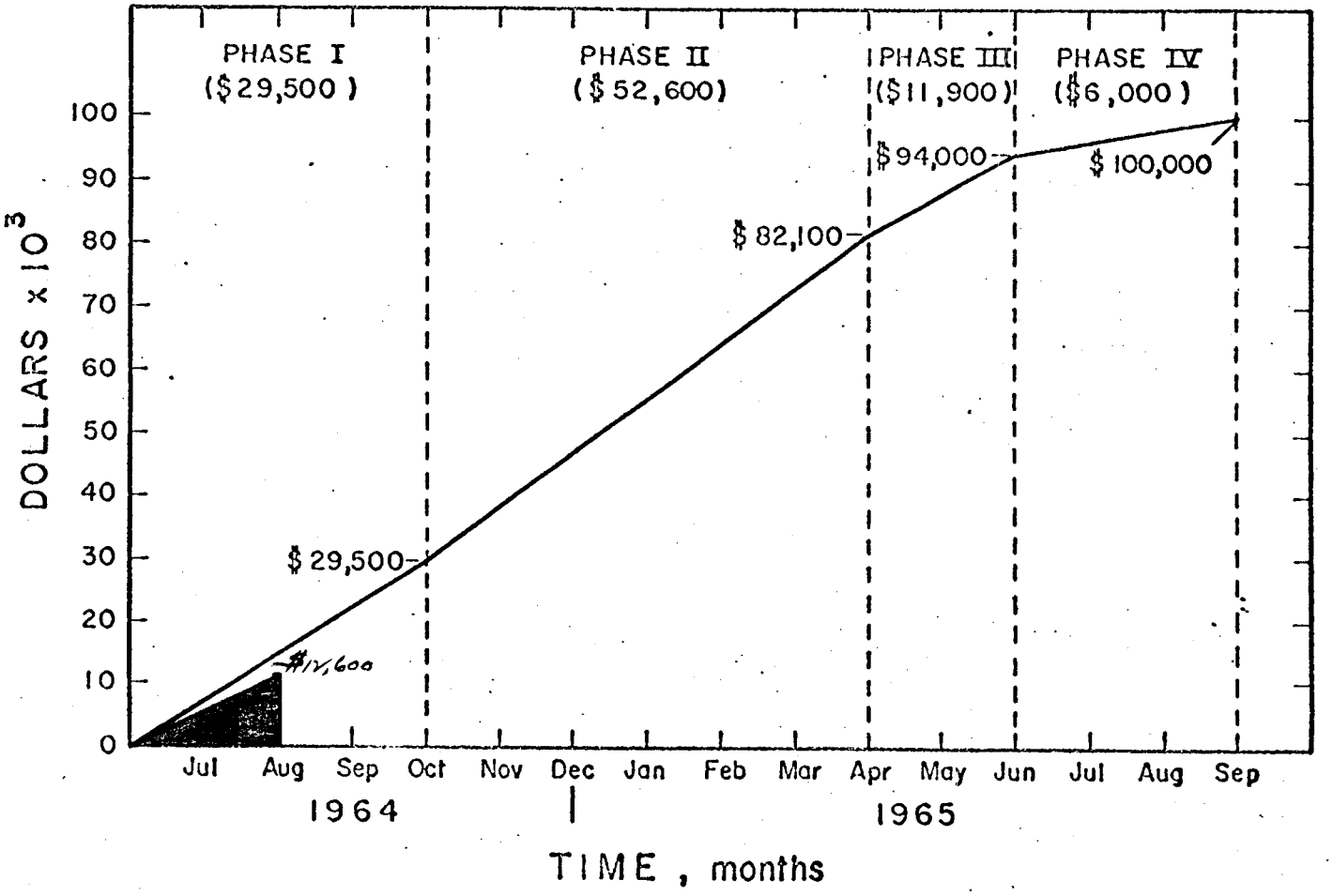
Contract No. : C-35560 A



# ESTIMATION OF DOLLARS vs. TIME

Contractor : NBS - CELD

Contract No. : C - 35560 A



# ESTIMATION OF PROJECT PLANS vs. TIME

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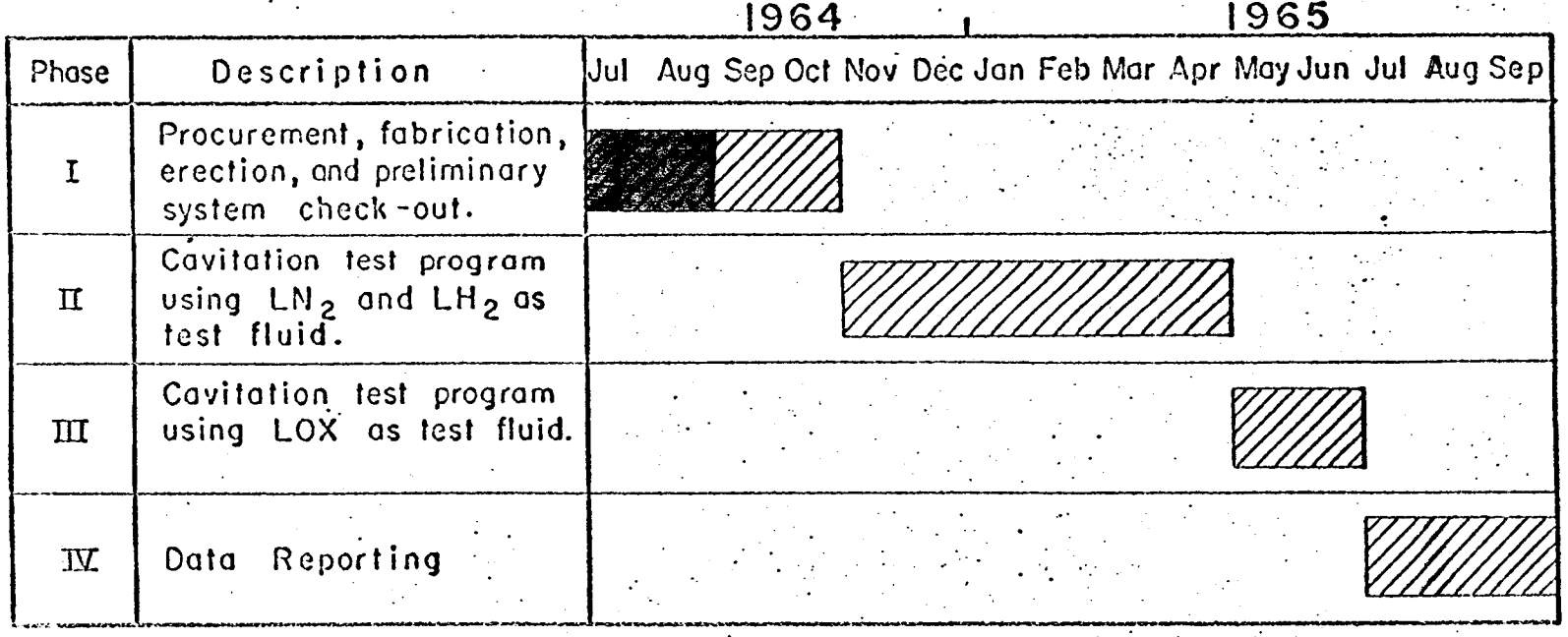
Contract No.: C-35560 A




| Phase | Description |
|---|---|
| I | Procurement, fabrication, erection, and preliminary system check-out. |
| II | Cavitation test program using $LN_2$ and $LH_2$ as test fluid. |
| III | Cavitation test program using LOX as test fluid. |
| IV | Data Reporting |